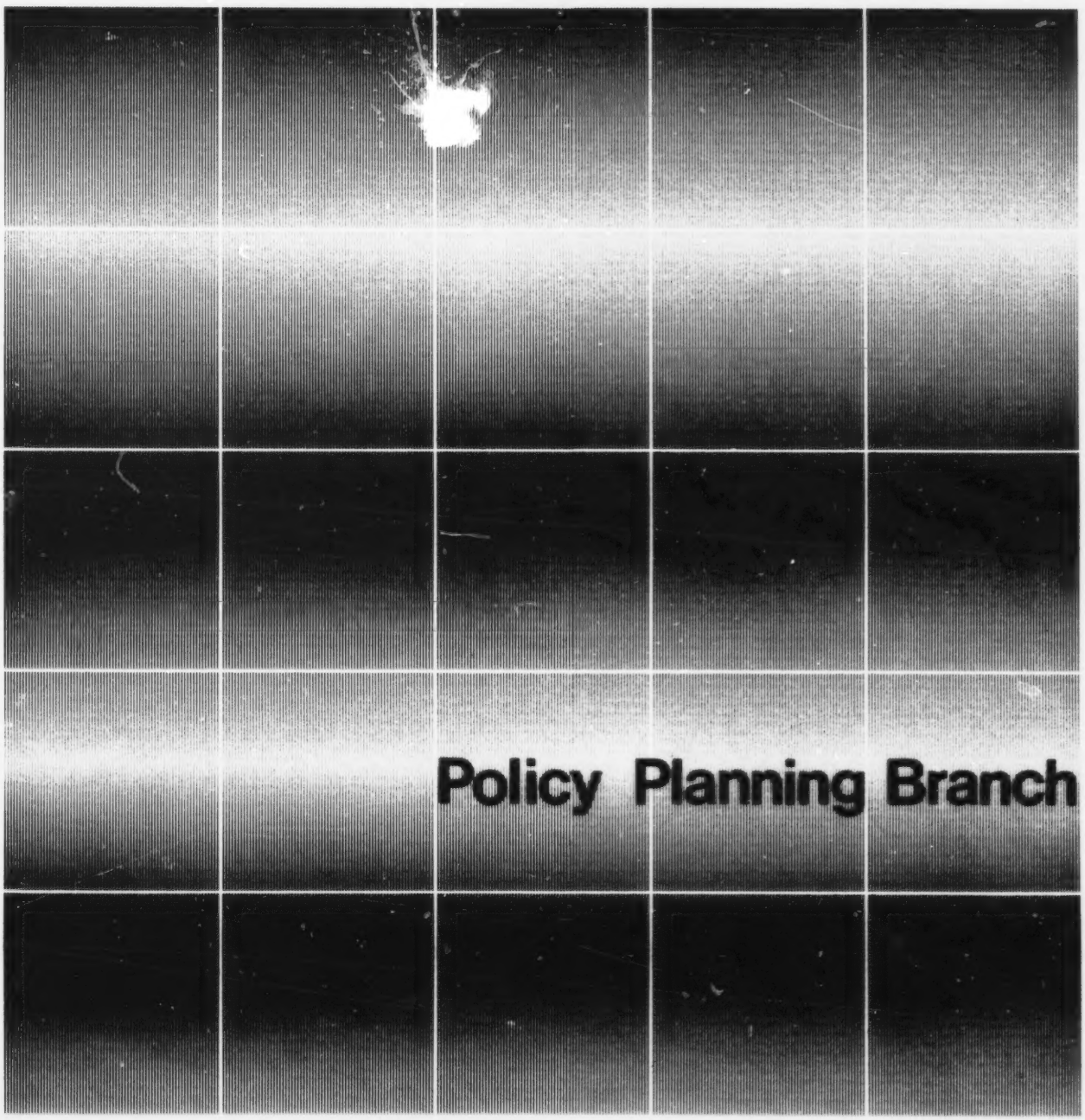
Ontario

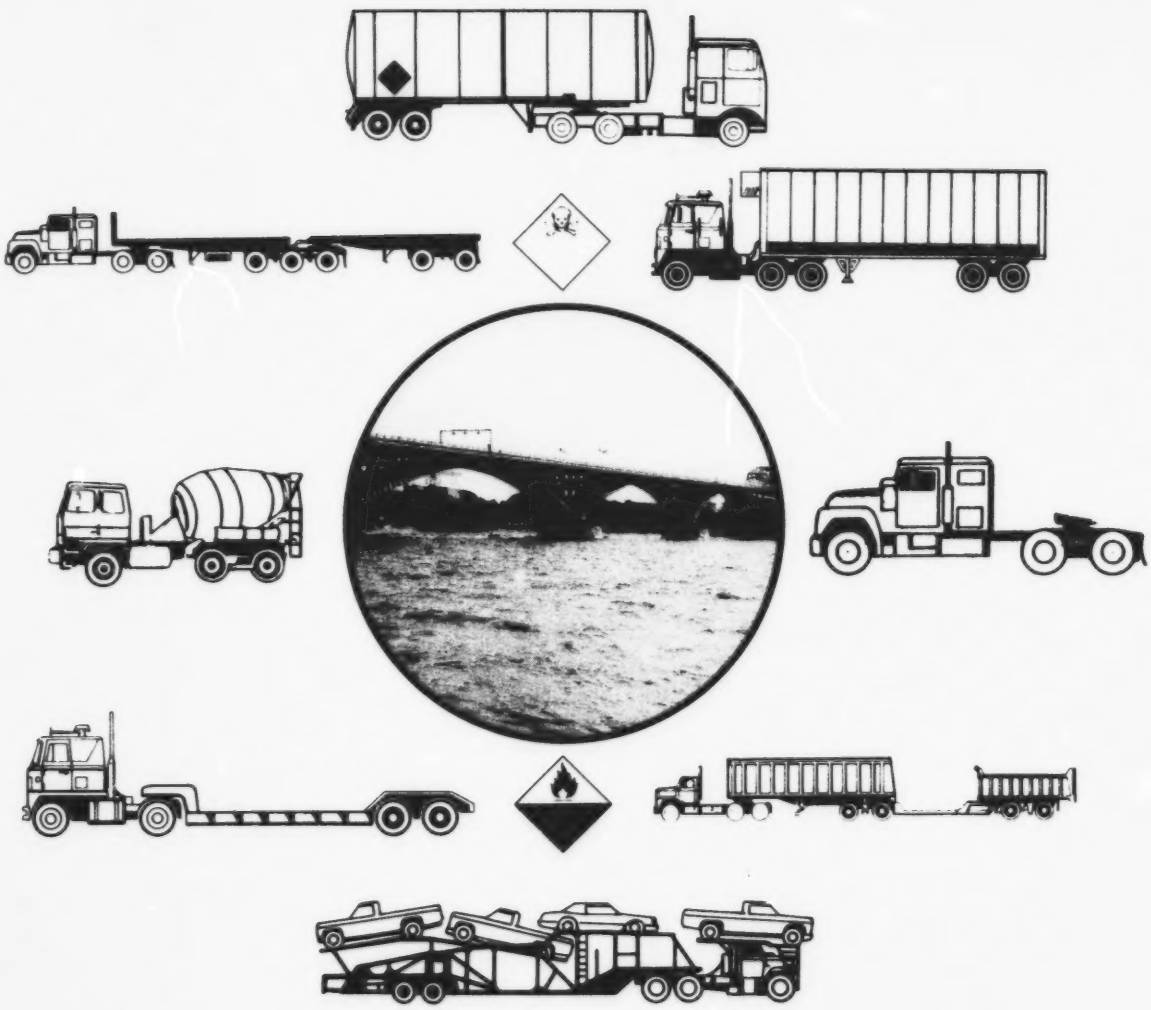
Ministry of
Transportation and
Communications

Policy
Planning and
Research Division



TDF-84-06

EXECUTIVE SUMMARY
Ontario
Commercial Vehicle Survey
1983



TDF – 84 –06

EXECUTIVE SUMMARY
Ontario Commercial Vehicle Survey 1983

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EXECUTIVE SUMMARY

The six sections in this summary contain the essential features of the analysis documented in the full report. It was prepared for the reader who is primarily interested in the magnitude of the industry indicators and trends, hence it presents only a portion of the details included in the full report.

1. Introduction

The Ministry of Transportation and Communication(M.T.C) has periodically conducted roadside surveys of trucking and freight movements on Ontario highways (1961, 1971 and 1978). The data collected from each survey proved valuable to address the needs of the time, which included:

- evaluation of changes in legislation,
- deliberations of Select Committees,
- vehicle registration (e.g. recipocity),
- highway planning, design and safety,
- demand analysis and forecasting.

The Government of Ontario in 1981 set up a committee to review the industry as a whole and the Ontario Public Commercial Vehicle (PCV) Act in particular. The Committee indicated that improved statistics would be useful in analysing future policy issues in trucking as well as in gauging the effects of regulatory reforms after 1983.

As well as the needs of this committee, the list of issues related to trucking has grown to include vehicle utilization and energy consumption, transport of dangerous goods, effects of economic downturn, environmental impacts and inter-modal transport.

These factors strongly indicated the need for another commercial vehicle survey along the same line as the 1971 and 1978 surveys to satisfy the data needs of this Ministry and other jurisdictions.

2. Survey Objectives

The primary objective of this study was to establish a profile of current trucking and trends, in order to provide information for the planning, delivery and evaluation of the Provincial Highway and Transportation Regulation Programs.

Aside from the above primary objective, this study was specifically aimed at gathering information on:

- the nature and the extent of international and inter-provincial truck movements,
- the nature and the extent of the dangerous goods movement.

3. Survey Methodology

The 1983 Commercial Vehicle Survey was carried out between April and August 1983. It was conducted at 43 inspection stations, 8 international and 3 inter-provincial border crossings. Permission to conduct the survey at some of the international border crossings was not granted by the bridge operating authorities. Since the survey was also conducted at the truck inspection stations in the general vicinity of the border crossing points, it is believed that a substantial portion(90%) of the international movement has been captured.

All trucks were routed through the weighing platforms and interviewed on a random basis. Truckers refusing to be interviewed (less than 1% of the sample) were free to proceed. After completion of the interview the bill of lading and other documents relating to the carriage of dangerous goods were photocopied. The interviews lasted between 8 and 12 minutes.

The location of survey stations are shown in Appendices A & B

4. Data Description

4.1 General

A total of 13,213 commercial vehicle drivers were interviewed over a period of 1,296 hours at 54 survey locations. The overall sampling rate was 20.1%.

4.2 Adjustments

The following adjustments were effected;

a) Expansion of sample to a 24 hour count.
b) Correction factor to reduce the 24 hour count to an average day value.
c) Adjustment to remove the bias introduced for trips passing through more than one survey location.

4.3 Limitations

a) The prime limitation of the data related to the fact that it was taken on only one weekday of the year. Hence, it provides no information about the daily, weekly, monthly or seasonal variations.

b) Only trucks travelling on major highways were exposed to the survey. Fortunately, the inspection stations are located such that a high proportion of the intercity truck traffic is captured at these stations.

c) At the international border crossings and some survey locations, the actual axle weights were not recorded due to safety considerations. At the same locations the invoices could not be photocopied due to the absence of a convenient power supply. The commodities carried and the commodity weights were extracted from the waybills or the information was solicited from the truck operator.

5. Survey Results - Overall

The results of the survey are documented under the categories of overall trucking, empty truck movements, dangerous goods movements and border movements.

5.1 Traffic Data

Truck traffic was generally heaviest during the hours of 0900 - 1500. See Figure 1. The variation in traffic is location dependent.

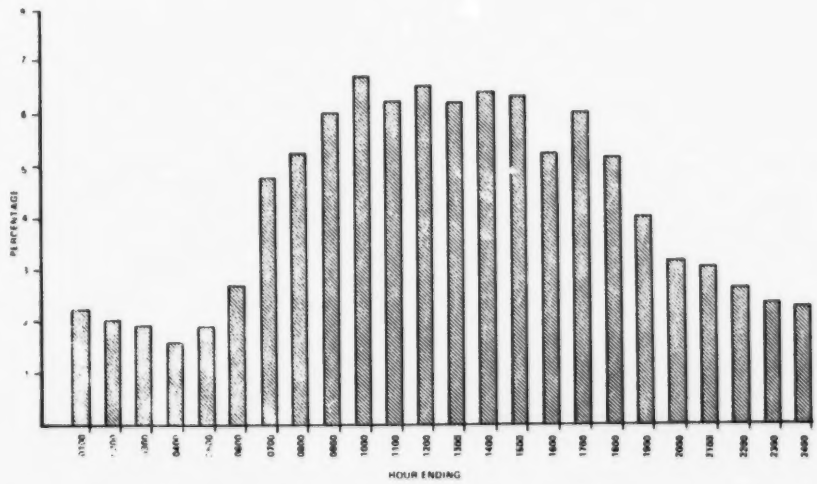


Figure 1 / Distribution of All Movements

5.2 Vehicle Data

The Commercial Vehicle Survey, 1983 did not include the light 2 axle category, as they are not required to pass through truck inspection stations. The heavy 2, 3 or 4 axle trucks are referred to as short trucks and the combination units are treated as long trucks. In terms of absolute numbers the largest number of long trucks passed through the inspection stations located at Whitby, Oakville and Streetsville N. and S. The incidence of long trucks was heaviest across the border crossings at Sault Ste. Marie and Pigeon River, being 95% of all truck traffic at each point.

The predominant type of truck is the tractor-trailer at 66.4% of the population. Straight trucks form over one-fifth of the population. Tractors with two trailers were found to be only 4%. The percentage of combination trucks appears to have increased slightly when compared with 1978 figures. See Figure 2.

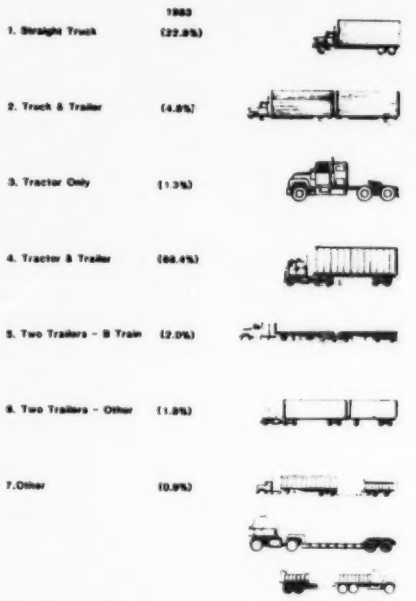

1983
1. Straight Truck (22.8%)
2. Truck & Trailer (4.8%)
3. Tractor Only (1.3%)
4. Tractor & Trailer (66.4%)
5. Two Trailers - B Train (2.0%)
6. Two Trailers - Other (1.8%)
7. Other (0.9%)

Figure 2 / Schematic of Truc kTypes

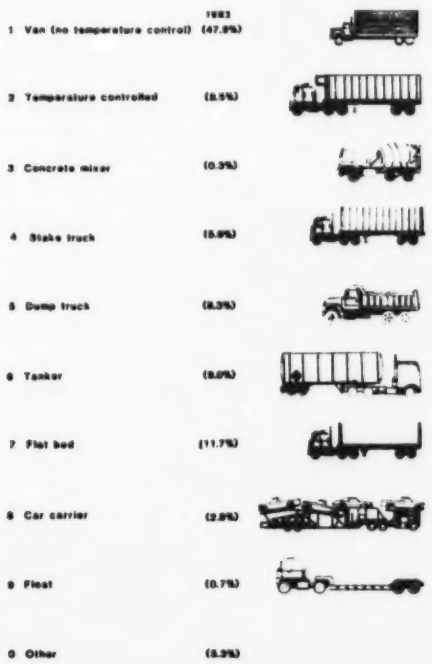


Figure 3 / Schematic of Truck Body Styles

In terms of body types, the vans predominate (56.4%). The other frequently occurring identifiable body types were the flatbeds (11.7%) and tankers (9.0%). See Figure 3. In comparison wth the 1978 survey results, the percentage of trucks and tractors with van type body styles (inclusive of temperature controlled vans) has increased. An increase in temperature controlled trucks used mainly in the carriage of perishable food items was noted.

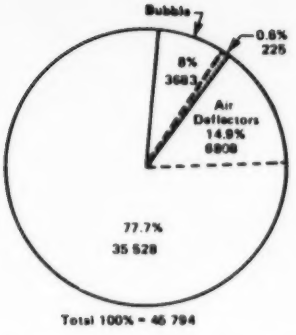


Figure 4 / Usage of Air Deflectors and Bubble Type Devices

Some trucks are equipped with wind deflectors and bubble type devices to conserve fuel. Generally, the bubble devices are fitted on trailers and van style trucks while deflectors are installed on the power unit. It was observed that 8.0% of the trucks were equipped with bubble devices and about 15.0% had air deflectors. See Figure 4.

The private carriers appear to be utilizing lighter vehicles (average R.G.V.W of 33,300 kg) than the for-hire carriers with (average R.G.V.W of 42,000 kg), obviously dictated by the demand patterns of each carrier type. The registered gross vehicle weight of half the trucks is less than 38,000 kg.

Nearly 20% of trucks were leased vehicles, a figure virtually unchanged from the 1978 survey. About 22% of the drivers who reported that the truck was rented/leased were either not sure or did not know the duration of the lease. Three to five year lease terms appear to be the most popular arrangements. Short term leases (two weeks or less) were under 10%; long term leases(8 or more years) were at 12.6%. Over three-quarters of all trucks leased are tractor-trailer combinations. Private carriers were seen as more likely to rent or lease trucks than for-hire carriers.

Ontario registered trucks had decreased from 90.2% in 1978 to 84.0% in this survey. Trucks from Quebec(5.3%) and United States(6.1%) have shown increases. The largest number of U.S trucks using the Provincial highway system were from New York (2.0%) and Michigan(1.0%). This suggests an increase in the use of non-Ontario registered vehicles in inter-provincial trucking.

5.3 Carrier Share

The share of private trucks in terms of movements has increased from 42% in 1971 to 50.6% in 1978 and to 55.2% in this survey. See Figure 5.

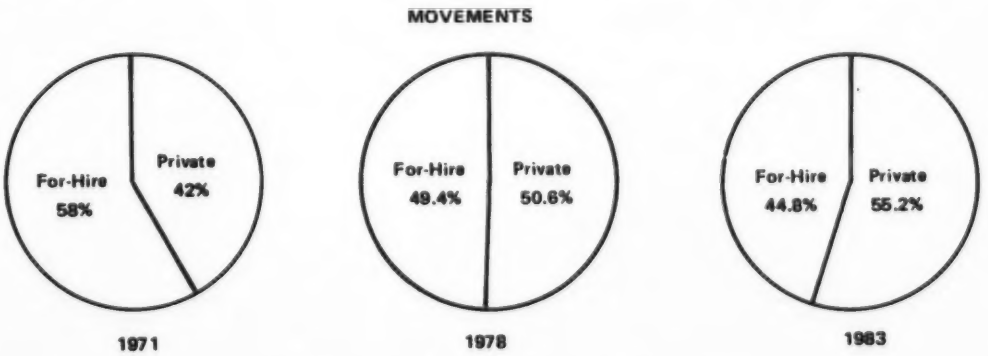


Figure 5 / Share of Private and For-Hire Trucks

Most straight trucks were operated by private carriers. Tractor-trailers and truck-trailer were seen to be about equally popular with both carriers. For-hire carriers seem to use tractors with two-trailers more than private carriers. In terms of body types the for-hire carriers had 84% of the car- carriers and 53% of the dump trucks yet only 16% of the concrete mixers.

Analysis of load-volume utilization of trucks revealed that 48% of the for-hire trucks were fully loaded while only 37% of the private trucks carried a full load. In 1978 the comparable figures for the for-hire and private carriers are 58% and 43% respectively.

5.4 Trip Data

Nearly 70% of the truck movements on major highways in Ontario were intra-provincial trips. The extra-provincial (one end outside the Province) form 27% and the remaining 3% are in-transit (both ends outside). See Figure 6.

The main movement of truck trips was between manufacturing establishments (12%). Another 8.6% of the trips were between warehouses.

The average trip length of for-hire carriers was about 20% greater than that for private carriers(320 km). However, the average trip length for all trucks was 345 km.

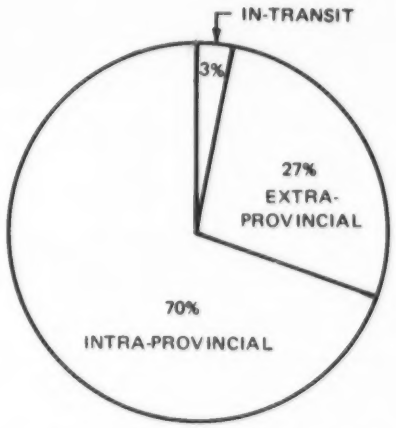


Figure 6 / Distribution of Intra/Extra Provincial and in-Transit Trips

5.5 Commodity Data

A partial listing of the most frequently carried commodities and their distribution is given in Table 1. The twelve main commodities together represent 42% of the total number of truck movements. Comparing these figures with those obtained in the 1978 Commercial Truck Survey indicated a redistribution of the commodity movements, together with the inclusion of commodities not ranked before. It was seen from the 1978 survey that for-hire trucks were mainly engaged in the movement of crude non- metallic minerals, cars and general freight. In this survey for-hire carriers appear to have a larger share of the movement of commodity groups such as general freight, road motor vehicles and automotive parts,iron/steel and alloys. Commodity groups such as wood fabricated materials, beverages and food items are more often carried by private carriers.

5.6 Load Data

Compared with the 1978 survey a notably higher percentage of empty and a lower percentage of fully loaded truck movements was observed. This applies both to number of movements and in terms of overall distance travelled.

The mean actual gross vehicle weight is 26,700 kilograms for for-hire, 20,600 kilograms for private carriers and 23,300 kilograms for the total sample. This is about 63% of the average R.G.V.W. of all trucks passing through the survey stations.

FOR-HIRE
26,700 kg

PRIVATE
20, 600 kg

The for-hire carriers on average carry commodity weights about 25% greater than private carriers (13,100 kg). The for-hire carriers have about 55% of the total of 186.6 million tonne-km. This reduces to 5,970 tonne-km per loaded vehicle.

5.7 Driver Data

A tabulation of driver employment categories by industry segment indicated that the majority (82.0%) of the drivers were company employees. The percentages for drivers employed by agency and broker firms are relatively small at 2.5% and 5.5% respectively. Private carriers seem to engage agency drivers much more than for-hire carriers. Conversely, the for-hire carriers appear to favour brokers. Figure 7 depicts the breakdown of driver employment categories.

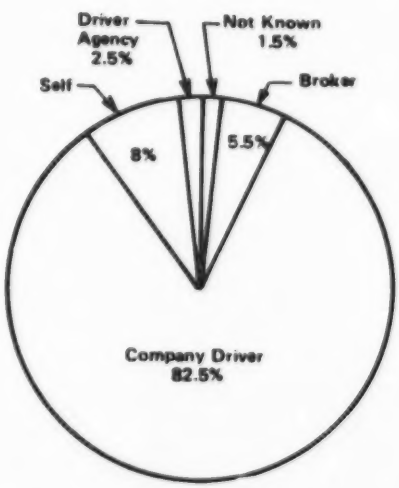


Figure 7 / Distribution of Driver Employment Categories

6. Survey Results - Specific

6.1 Empty Truck Movements

The percent of empty trucks was seen to be high for stations located somewhat close to large urban centres. Survey locations at Woodbridge, Oakville and Streetsville are typical of this situation. The provincial average of completely empty movements stand at 31.8% and another 24.2% of the movements carried less than a full load.

The highest incidence of empty truck movement occurred in Central Region and in all three districts within this Region the percent of empty movements was uniform at about 33%. The districts of Thunder Bay (9.2%), Sault Ste. Marie (17.0%) and Kenora (20%) recorded lowest incidence of empty movements.

The incidence of empty truck movements for private carriers is about 50% higher than that of for-hire carriers. The same observation was recorded in the 1978 survey. In terms of distance travelled, empty trips form over 20% of the distance covered by all trucks. This indicator was similar to that obtained in the 1978 survey. The above findings demonstrate that there were fewer for-hire trucks moving completely empty than private carriers.

Within the truck type classification, the incidence of empty trucks was found to range from 25.8% for truck-trailer to 36.6% for two-trailers(B-train). This ignores the tractor only category, which stands naturally at 100% empty. Based on the number of empty trips recorded in the survey, Figure 8 shows the distribution of these trips among the truck types.

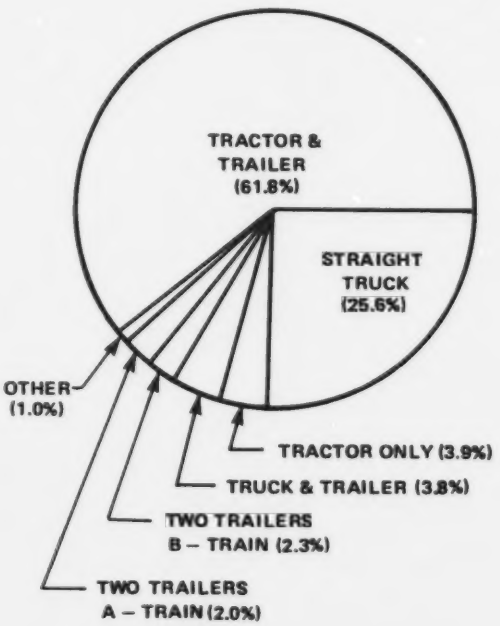

TRACTOR & TRAILER (61.8%)
STRAIGHT TRUCK (25.6%)
OTHER (1.0%)
TRACTOR ONLY (3.9%)
TRUCK & TRAILER (3.8%)
TWO TRAILERS B – TRAIN (2.3%)
TWO TRAILERS A – TRAIN (2.0%)

Figure 8 / Distribution of Empty Truck Types

Trucks and tractor-trailers with van bodies form the largest group (56%) in the empty movement. Flatbeds(12%) and tankers(9%) are the other significant categories of body style. Higher figures for dump and tanker trucks are seen in this distribution when compared with the distribution for the total population mainly due to the specialized nature of these trucks.

The mean trip distance for for-hire and private carriers is about 240 km. Empty trips tend to be shorter than loaded trips.

6.2 Dangerous Goods Movements

General commodity groups such as explosives, flammable and combustible liquids/solids, oxidizing agents, poisonous and infectious substances, radioactive materials and corrosive substances are considered as dangerous.

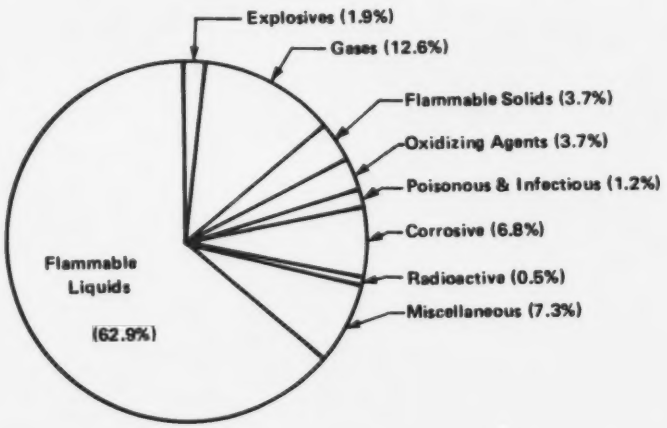


Figure 9 / Distribution of Dangerous Goods Classes

The percent of trips in the carriage of dangerous goods varied from station to station. However, the overall figure for the survey was 8.1% of all truck movements and 12.3% in terms of tonnage. Hamilton District seems to record the highest incidence of dangerous goods movement. Flammable liquids (63%) were the most frequently carried dangerous goods followed by gases (12.6%) and corrosive substances (6.8%). See Figure 9.

The incidence of tractors with two trailers engaged in the dangerous goods movement is more than twice that of the population while straight trucks are used less frequently. As for body styles, tankers (57%) predominate followed by vans (31%). Nearly 40% of trucks carrying dangerous goods are tractor-trailer tankers.

On an average 36% of vehicles carrying dangerous goods displayed warning placards. It is encouraging to note that almost 50% of the tankers displayed placards. In terms of class of dangerous goods, over 40% of trucks carrying explosives, gases (all forms), poisonous substances, radioactive materials and corrosive substances displayed placards and thus did better than average. On the other hand, only 16.5% of the trucks carrying flammable solids displayed any placards or warning signs.

As expected, a high proportion of all dangerous goods movements originate from manufacturing establishments (44%), and warehouses (13%). Major destinations were manufacturing 28%, warehouses 16%, retail establishments 15% and distribution centers 13%.

The distribution of Province/State of registration of trucks carrying dangerous goods indicated that Ontario is the province of registration for the highest percentage (78%), with New York (8.0%) and Quebec (6.0%) ranking second and third; a higher proportion of trucks registered in U.S. and Quebec are engaged in the movement of dangerous goods when compared with the total survey population.

In terms of carrier type, private carriers appear to take more than 60% of all dangerous goods movements and more than 55% in terms of tonnage. The private carriers have a larger share of the movements for all classes of dangerous goods except poisonous and radioactive substances, yet they have a larger share of the tonnage in only half the classes.

In comparison with the distribution for the entire population a distinct use of heavier vehicles is noted. Private carriers recorded a larger share of the movement in almost all weight classes.

About 26% of the trucks carrying dangerous goods are reported leased. This statistic is slightly higher than that for the population (20%). About 45% of the leased/rented trucks are reported to be for periods between 3 - 5 years.

About 55% of all trips made by private carriers are less than 200 km, whereas about 45% is the corresponding number for the for-hire carriers. It is noted that the average trip length for private carriers is about 15% less than that for the for-hire carriers.

6.3 Border Movements

The proportion of trips engaged in trans-border transport varied from station to station. The overall figure for the survey was about 30% in terms of truck movements and 38% in terms of tonnage. The breakdown of the border movement into components is depicted in Figure 10.

About 40% of all trucks involved in the border movement are van type tractor-trailers. Flatbed tractor-trailer combinations at 12.3% form the next highest group among the different bodytypes.

The incidence of energy saving devices on trucks engaged in the trans-border movement is slightly higher than that for the survey population (22.3%). In the case of the inter-provincial movement a higher figure of 27.0% is seen.

In comparison with the average R.G.V.W. (37,200 kg) for the survey population, a slightly larger vehicle (average 41,100 kg) is utilized in the border movement.

The incidence of leased vehicles was found to be 26.7% of the vehicles engaged in border movements. Over 40% of the leased trucks were found to have been contracted out for five or more years.

For the Province/State of registration of trucks engaged in the border movement, the Province of Quebec (14%) has the highest interaction with Ontario followed by New York State (6.4%) Michigan (3.3%) and Manitoba (2.8%).

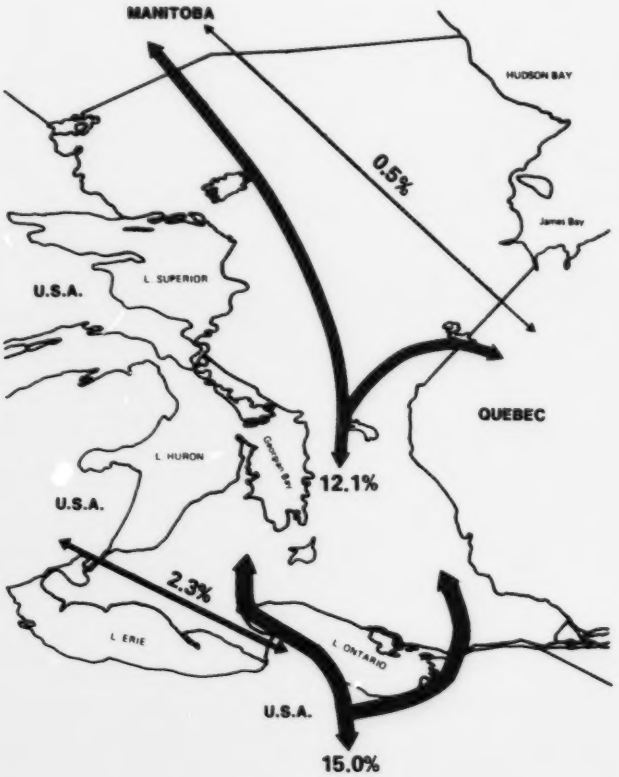


Figure 10 / Breakdown of the Border Movements

The split between carrier types for the border movements was found to be 46.1% for the for-hire carriers and 53.9% for the private carriers, virtually the same as for the total survey population. The mix of carrier types in the three components is generally about the same, with a slight favouring of for-hire carriers in the in-transit movement.

Frequency distributions of trip lengths for the two carrier types indicated 840 km for the for-hire, 750 km for private carriers and 790 km overall. The average trip length for the border movement is about twice that for the survey population. This is true for the trips made by each of the two carrier types.

The origin of a significant number of trips is manufacturing, with warehouses a distant second. Over a quarter of all trips are distined to manufacturing, followed very closely by warehousing. About 40% of the trips involve manufacturing and/or warehousing at both ends of the trip.

It is seen that the incidence of the empty movement for all three components of the border movements was less than that for the survey population (29.0%).

Roads motor vehicles and automotive parts, iron, steel and alloys, and paper and paperboards rank first, second and third as the most frequently carried commodities (excluding the "Other" category). The for-hire carriers appear to have a larger share of the movements in these three commodities. Private carriers seem to have a larger portion of the movement of commodities such as fabricated wood material, petroleum and chemical products and food items.

The incidence of the carriage of dangerous goods for the inter-provincial, international and in-transit movements are 8.0%, 10.% and 6.1% respectively. Placards or warning signs are displayed on 32.4%, 51.6% and 28.2% of the trucks carrying dangerous goods in the three categories respectively. The majority of movements both for international and inter- provincial are in the flammable and combustible class. In the case of in-transit, nearly a third of all such movements fall into that class. Compressed gases at 10% form the second highest class.

The majority (77%) of the drivers reported that they were company employees. The percentages for drivers employed by agency and broker firms are relatively small. The company drivers are about equally split between the two carrier types. Private carriers seem to engage agency drivers much more than for-hire carriers. About two- thirds of the drivers working for agencies have done so for one or more years.

7. COMMENTS

The information and statistics collected during the survey has contributed to achieving the objectives set for the survey.

It is anticipated that the collected data will provide valuable inputs to the Ministry in its continuing policy and program delivery work. In addition, this summary and its companion report indicate the type of data now available for use by agencies concerned with commercial vehicle movements in Ontario.

ACKNOWLEDGEMENTS

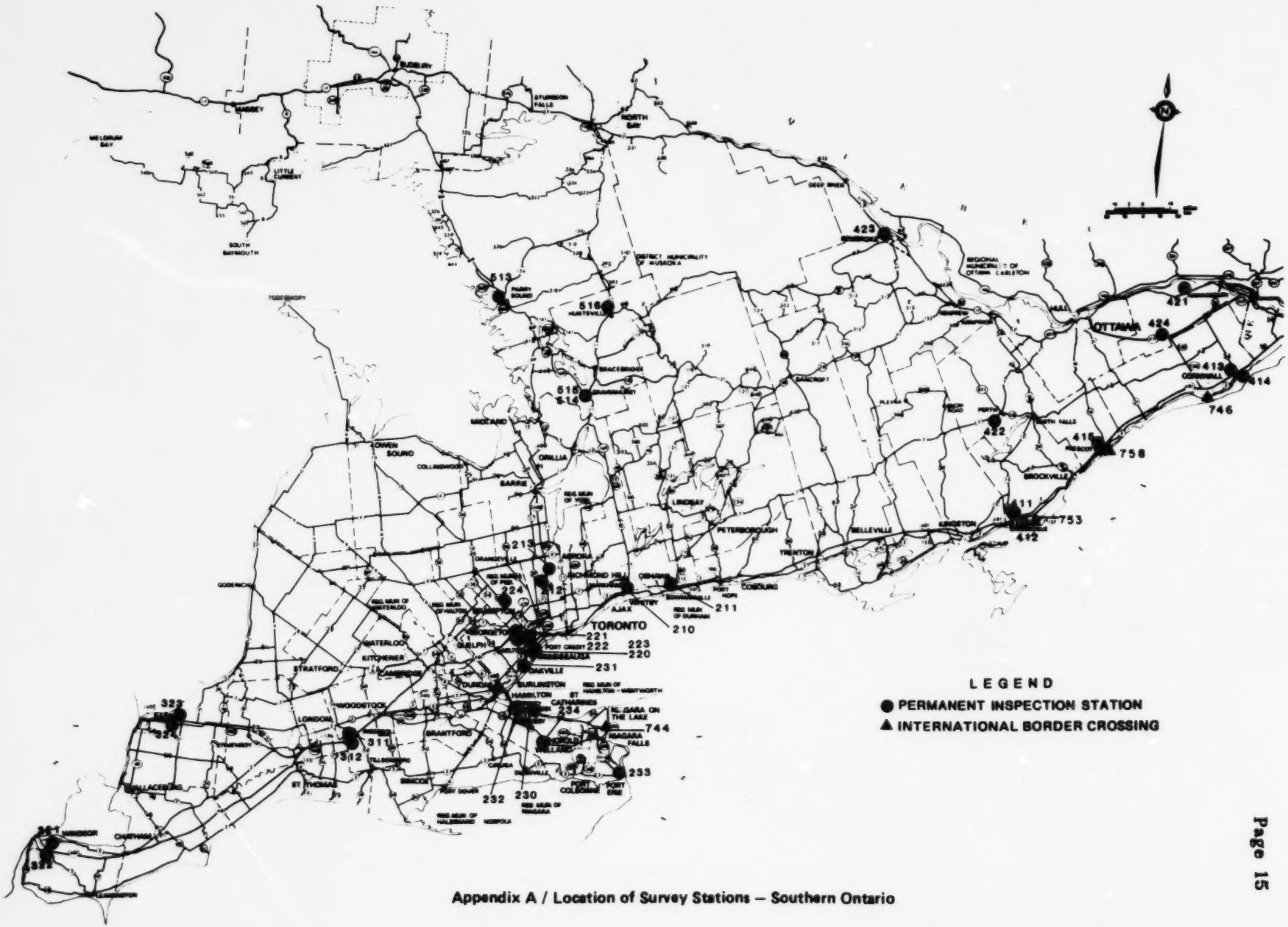
This study was facilitated by the co-operation and assistance of many officials in the Transportation Regulation Operations Division, M.T.C., Transport Canada, Statistics Canada and the Ontario Trucking Association. The authors are truly grateful and appreciative of this support.

COMMOD No.	COMMODITY Groups	MOVEMENTS 1978 %	MOVEMENTS 1983 %	TONNAGE 1983 %
99	Commodities that do not fall into any other category.	11.0	6.7	6.8
58	Road Motor Vehicle and automotive parts	7.2	6.3	8.3
44	Iron,steel and Alloys	6.6	3.7	7.7
14	Foods,Food Materials and Food Preparation	3.2	3.1	3.9
35	Paper and Paper-Board	3.5	3.1	4.6
27	Crude Non-metallic Minerals(except coal and Petroleum)	6.0	2.6	6.4
33	Wood Fabricated Materials	4.1	2.6	5.3
47	Non-metallic mineral Basic Products	4.0	2.5	4.9
95	Containers and closures	1.0	2.2	2.0
23	Crude Wood Materials	-	2.2	5.3
42	Chemical and Related Products	1.5	2.1	3.1
17.	Beverages	1.7	2.0	3.7
01.	Meat and Meat Products	2.0	1.9	1.6
	All Other Groups	48.2	58.2	36.4
	Total	100.0	100.0	100.0

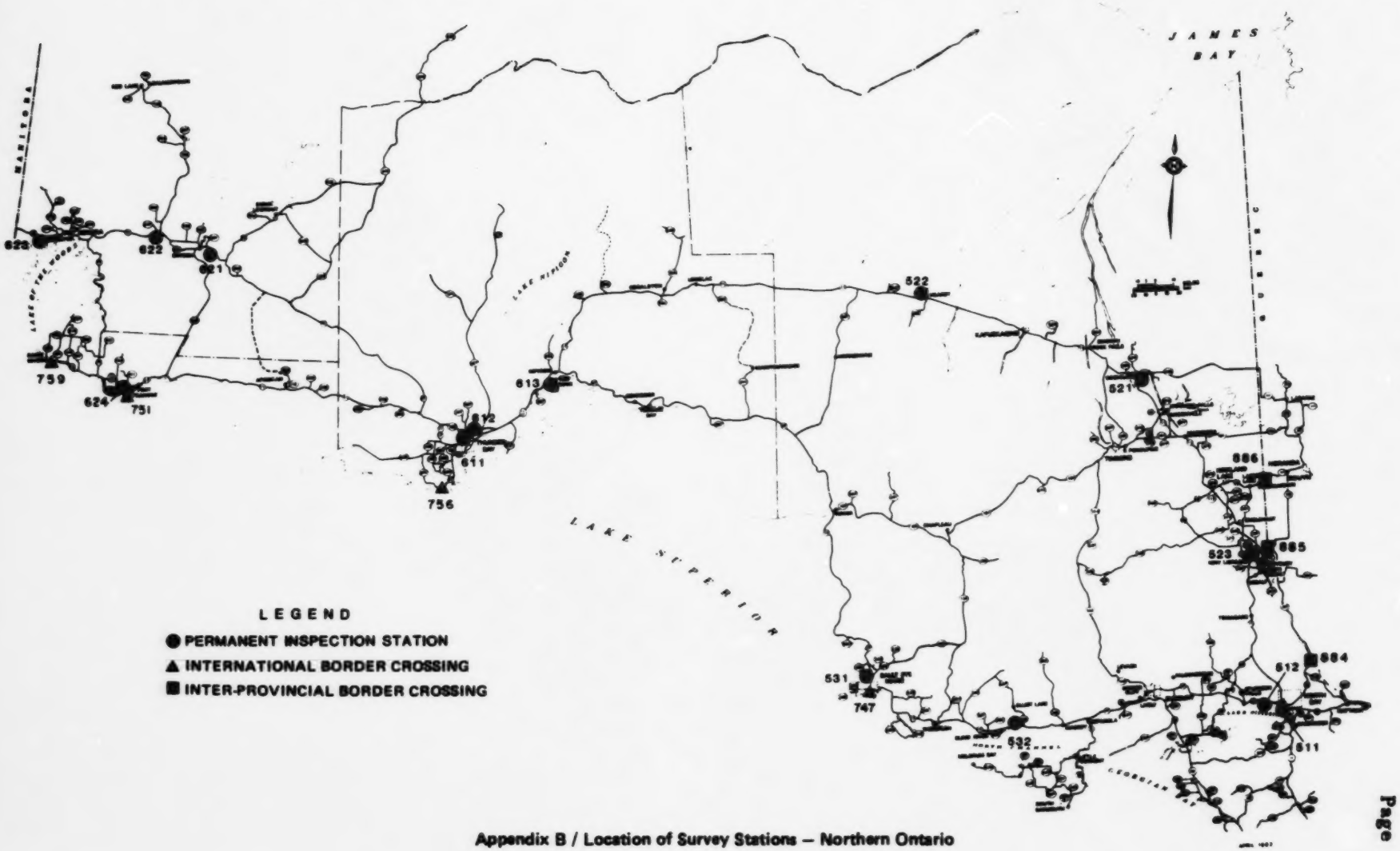
Table 1 Distribution of the Most Frequently Carried Commodities

Survey Period	May - November 1978	April- August, 1983
Vehicles Surveyed	9,666	13,213
Avg. Station Duration(hrs.)	16.0	23.6
Average Pay-load		
For-hire	17.7 tons	16.5 tonne
Private	12.8 "	13.1 "
Combined	15.4 "	14.5 "
(Excluding empties)		
Average Trip Length		
For-hire	434 km	380 km
Private	367 "	320 "
Combined	407 "	345 "
Carrier Mix -in terms of;		
Movements		
For-hire	49%	45%
Private	51%	55%
Distance		
For-hire	54%	49%
Private	46%	51%
Commodity Weight		
For-hire	59%	53%
Private	41%	47%
Leasing	20%	20%
Motive Power		
Diesel	74%	89.4%
Gasoline	26%	9.7%
Propane/other	-	0.9%
Origin-Destination		
Intra-provincial	72%	69.5%
Extra-provincial	28%	30.5%
Load Factor/Load Utilization		
Movements		
Empty	26.6%	31.8%
Partial Load	23.4%	25.8%
Full	50.0%	42.4%
Distance		
Empty	20.4%	22.1%
Partial Load	18.2%	23.6%
Full	61.4%	54.3%

Table 2 Selected Comparative Data



Appendix A / Location of Survey Stations – Southern Ontario



Appendix B / Location of Survey Stations – Northern Ontario